



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,141	04/08/2004	Dun-Nian Yaung	24061.180 (TSMC2003-1127)	8959
42717	7590	07/18/2006	EXAMINER	
HAYNES AND BOONE, LLP 901 MAIN STREET, SUITE 3100 DALLAS, TX 75202			LUU, THANH X	
			ART UNIT	PAPER NUMBER
			2878	

DATE MAILED: 07/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/821,141	YAUNG, DUN-NIAN	
	Examiner	Art Unit	
	Thanh X. Luu	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-18, 20 and 22-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10-18, 20 and 22-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to amendments and remarks filed July 6, 2006.

Claims 1-8, 10-18, 20 and 22-26 are currently pending.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 10, 12, 13, 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Fukuyoshi et al. (U.S. Patent Application Publication 2001/0009442).

Regarding claims 10, 12, 13, 16 and 17, Fukuyoshi et al. disclose (see Fig. 2) a microlens array and a method of manufacturing, comprising: a substrate (11) having a plurality of photo sensors (12) located therein; a microlens layer (at 21c) comprising a plurality of microlenses located over the substrate, each of the microlenses including a substantially convex portion substantially aligned over a corresponding one of the plurality of photo sensors, wherein the plurality of microlenses are separated by a plurality of gaps (at 22; see also Fig. 3); and a dielectric film (31) located over and conforming to the microlens layer and filling the plurality of gaps. Fukuyoshi et al. also disclose (see Fig. 2) the plurality of microlenses are not integral to the dielectric layer,

wherein each of the plurality of gaps separating each of the microlenses reveals a portion of the surface of the dielectric layer, and wherein the dielectric film contacts the dielectric surface through each of the plurality of gaps; and (see paragraph [0029]; copolymers) the dielectric film comprises a first composition that is similar to a second composition of the microlens. As understood, a fill factor corresponding to a ratio of light incident on the microlens array and the plurality of photo sensors is at least about 50% since the same structure is disclosed. Fukuyoshi et al. also disclose (see paragraph [0039]) heating the patterned microlens material; and (see paragraph [0056]) forming a mask and etching as claimed.

3. Claims 1-4, 7, 8, 10-14, 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Uchida (U.S. Patent 6,583,438).

Regarding claims 1-4, 7, 8, 10-14, 17 and 18, Uchida discloses (see Fig. 1) a microlens device or array and method of manufacturing, comprising: a substrate (12) having a photosensor or photosensor array (at 14) located therein; a dielectric layer (5) located over the substrate; a first microlens (4) and second microlens located over the substrate and including a convex portion aligned over the photosensor; the microlenses are separated by a gap (not labeled) exposing a substantially planar surface of the dielectric layer; a dielectric film (3) located over and conforming to the microlenses, the dielectric film also contacting the portion of the dielectric layer surface that is exposed in the gap; and a protective layer (2 or 1) located over the dielectric film. Uchida also discloses (see Fig. 1) the first and second microlenses are discrete elements not integral to the dielectric layer; the dielectric film and the microlenses have substantially

similar compositions; and (see Fig. 2) the microlenses have different a refractive index than the dielectric film. As understood, a fill factor corresponding to a ratio of light incident on the microlens array and the plurality of photo sensors is at least about 50% since the same structure is disclosed. Uchida also discloses (see Fig. 1) a color filter (6) under the protective layer.

4. Claims 10, 11, 13 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Izumi et al. (U.S. Patent Application Publication 2004/0033640).

Regarding claims 10, 11, 13 and 17, Izumi et al. disclose (see Fig. 2) a microlens array, comprising: a substrate (6) having a plurality of photo sensors (7) located therein; a microlens layer (11) comprising a plurality of microlenses located over the substrate, each of the microlenses including a substantially convex portion substantially aligned over a corresponding one of the plurality of photo sensors, wherein the plurality of microlenses are separated by a plurality of gaps (at 11b or 12b); and a dielectric film (12) located over and conforming to the microlens layer and filling the plurality of gaps. Izumi et al. also disclose (see Fig. 2) a protective layer (5) located over the dielectric film; and the dielectric film comprises a first composition that is similar to the second composition of the microlens. As understood, a fill factor corresponding to a ratio of light incident on the microlens array and the plurality of photo sensors is at least about 50% since the same structure is disclosed.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2878

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 6-8, 11 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyoshi et al. in view of Izumi et al.

Regarding claims 1-3, 6-8, 11 and 18, Fukuyoshi et al. disclose the claimed invention as set forth above. Fukuyoshi et al. also disclose (see paragraph [0039]) heating the patterned microlens material; and (see paragraph [0056]) forming a mask and etching as claimed. Fukuyoshi et al. also disclose (see Fig. 2) a color filter (15). Fukuyoshi et al. do not specifically disclose a projective layer located over the dielectric film. Izumi et al. teach (see Fig. 2) a projective layer (5) over a similar microlens arrangement. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a projective layer as claimed in the apparatus of Fukuyoshi et al. for further protection (from damage or dust, etc.) as taught and improve detection.

7. Claims 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida in view of Abramovich (U.S. Patent 6,221,687).

Regarding claims 20, 22, Uchida discloses the claimed invention as set forth above. Uchida does not specifically disclose the color filter above the microlens and over the dielectric film. Abramovich teaches (see Fig. 4) locating a color filter (255) above the microlens. Thus, Abramovich recognizes that specific location the color filter is design choice and may be arranged either above or below the microlens. It would have been obvious to one of ordinary skill in the art at the time the invention was made

to provide the color filter above the dielectric film in the apparatus of Uchida in view of Abramovich as desired to obtain earlier filtering.

8. Claims 20 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyoshi et al. in view of Abramovich.

Regarding claims 20 and 22-26, Fukuyoshi et al. disclose the claimed invention as set forth above. Fukuyoshi et al. also disclose (see paragraph [0039]) heating the patterned microlens material; and (see paragraph [0056]) forming a mask and etching as claimed. Fukuyoshi et al. also disclose (see Fig. 2) a color filter (15). Fukuyoshi et al. do not specifically disclose the color filter above the microlens and over the dielectric film. Abramovich teaches (see Fig. 4) locating a color filter (255) above the microlens and a protective layer (257). Thus, Abramovich recognizes that specific location the color filter is design choice and may be arranged either above or below the microlens. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the color filter above the dielectric film in the apparatus of Fukuyoshi et al. in view of Abramovich as desired to obtain earlier filtering and more protection.

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi et al. in view of Abramovich.

Regarding claim 18, Izumi et al. disclose the claimed invention as set forth above. Izumi et al. do not specifically disclose a color filter as claimed. Abramovich teaches (see Fig. 4) providing a color filter layer (255) above the microlens for color detection and under a protective layer. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a color filter array

and the protective layer as claimed in the apparatus and method of Izumi et al. in view of Abramovich to obtain color detection and protection for the lenses.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Izumi et al.

Regarding claim 16, Izumi et al. disclose the claimed invention as set forth above. Izumi et al. do not specifically disclose the microlens comprises a polymer material. However, choosing the type of material for the microlens requires only routine skill in the art. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide use polymer as claimed in the apparatus of Izumi et al. as desired to obtain a more resilient lens.

11. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida in view of Sekine (U.S. Patent Application Publication 2001/0051405).

Regarding claims 5 and 15, Uchida discloses the claimed invention as set forth above. Uchida does not disclose an antireflective film as claimed. Sekine teaches (see paragraph [0011]) providing an antireflection film over microlenses to reduce reflection loss. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide use the dielectric film as an antireflective film as claimed in the apparatus of Uchida in view of Sekine to consolidate layers, reduce reflection loss and improve detection.

12. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over either one of Fukuyoshi et al. or Izumi et al. in view of Sekine.

Regarding claim 15, Fukuyoshi et al. and Izumi et al. disclose the claimed

invention as set forth above. Fukuyoshi et al. and Izumi et al. do not disclose an antireflective film as claimed. Sekine teaches (see paragraph [0011]) providing an antireflection film over microlenses to reduce reflection loss. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide use the dielectric film as an antireflective film as claimed in the apparatus of Fukuyoshi et al. or Izumi et al. in view of Sekine to consolidate layers, reduce reflection loss and improve detection.

13. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyoshi et al. in view of Izumi et al. and Sekine.

Regarding claim 5, Fukuyoshi et al. in view of Izumi et al. disclose the claimed invention as set forth above. Fukuyoshi et al. in view of Izumi et al. do not disclose an antireflective film as claimed. Sekine teaches (see paragraph [0011]) providing an antireflection film over microlenses to reduce reflection loss. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide use the dielectric film as an antireflective film as claimed in the apparatus of Fukuyoshi et al. in view of Izumi et al. and Sekine to consolidate layers, reduce reflection loss and improve detection.

14. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida in view of Applicant's Admitted Prior Art, hereinafter, AAPA.

Regarding claims 23-26, Uchida discloses the claimed invention as set forth above. Uchida does not specifically disclose manner in which the microlenses are manufactured. AAPA (see paragraph [0003] of specification) teaches masking, etching

and heating layers to form a microlens as claimed. AAPA further recognizes that such steps are conventional. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use such steps in the method of Uchida as desired to readily and cost-effectively manufacture the device.

Response to Arguments

15. Applicant's arguments filed July 6, 2006 have been fully considered but they are not persuasive.

Applicant simply concludes that the prior art does not disclose a fill factor corresponding to a ratio of a first amount of light incident on the microlens device and the photo sensor is at least about 50%. Examiner disagrees. First, as understood, since the same structure of the device is disclosed, such limitations are met. That is, the claimed invention is not structurally distinguishable from the prior art. Second, since the structure of the prior art is substantially the same relative size (see Figs.) as Applicant's invention (see Figs.), as understood, the fill factor is "at least about 50%." That is, the terms "at least about 50%" can be reasonably interpreted to encompass any structure that is similar in relative size to Applicant's disclosed device. Thus, Applicant's conclusory statement is not found to be persuasive. Lastly, it is unclear where such a feature is shown in Applicant's invention.

Therefore, as set forth above, this rejection is proper.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is 571-272-2441. The examiner can normally be reached on M-F 6:00AM-3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

Art Unit: 2878

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Thanh X Luu
Primary Examiner
Art Unit 2878

07/2006